

Remarks

Reconsideration of this application, as amended, is respectfully requested.

New claims 77-79 are fully supported by the specification as originally filed, for example in Figure 7 and at paragraphs 70-74.

With reference to the Office Action of September 23, 2009, the rejections under 35 USC 112, second paragraph, are moot in view of the foregoing amendments. Further, the claims are patentable over Watabe (US 5500256), even when considered in view of Sasaoka (US 6949144) and Sakai (US 5070813). The reasons for patentability are discussed further below.

With reference to Figure 7, new claim 77 recites:

An atomic layer deposition (ALD) apparatus (700), comprising:

a reaction chamber (710) having a wafer support (712) disposed therein;

a first gas flow pathway (706, 717, 716) coupled between a first precursor source (A) and the reaction chamber (710) through a gas distribution apparatus (728) disposed within the reaction chamber (710);

a second gas flow pathway (708, 719, 718) coupled between a second precursor source (B) and the reaction chamber (710) through the gas distribution apparatus (728) disposed within the reaction chamber (710);

a third gas flow pathway (752, 716, 718) coupled between a first gas source (752) different than the first and second precursor sources (A, B) and the reaction chamber (710) through the gas distribution apparatus (728) disposed within the reaction chamber (710);

a fourth gas flow pathway (742, 744, 746, 748, 750, 736) coupled between a second gas source (742) different than the first and second precursor sources (A, B) and the reaction chamber (710) through the gas distribution apparatus (728) disposed within the reaction chamber (710), the fourth gas flow pathway

characterized by two separate, selectable gas flow pathways (748 & 744, 750 & 746), one of which has a higher conductance than the other; and

a pumping arrangement (720, 722, 730) that includes a controllable flow conductance (720) and a pump (730), the pumping arrangement being coupled downstream of the reaction chamber (710).

Watabe does not describe such an apparatus. In particular, Watabe does not describe an apparatus that includes a fourth gas flow pathway characterized by two separate, selectable gas flow pathways, one of which has a higher conductance than the other, in combination with the other elements of claim 77. At best, Watabe describes an apparatus having two gas flow pathways, each of which is shared by a pair of gas/precursor sources. These are structural differences between the apparatus disclosed in the cited reference and the claimed apparatus and so claim 77 is patentable over Watabe.

Sasaoka is cited for teaching an inert gas source. Such teachings are irrelevant to the distinctions between the apparatus recited in claim 77 and that disclosed by Watabe. Accordingly, even if the teachings of Sasaoka concerning the use of an inert gas source were considered in combination with those of Watabe, one would still not arrive at the apparatus recited in claim 77. Hence, the claim is patentable over this combination of references.

Sakai is cited for teaching an iris throttle valve for controlling reactor chamber pressure. Such teachings are irrelevant to the distinctions between the apparatus recited in claim 77 and that disclosed by Watabe even when considered in combination with Sasaoka. Accordingly, even if the teachings of Sakai concerning the use of an iris throttle valve were considered in combination with those of Watabe and Sakai, one would still not arrive at the apparatus recited in claim 77. Hence, the claim is patentable over this combination of references.

The dependent claims are patentable over the cited references for at least the same reasons as claim 77.

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Respectfully submitted,
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